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ABSTRACT

This paper first outlines the need for an application of Total Quality Management (TQM) principles to create a Total Quality Education (TQE) System. The paper then suggests that a combination of Competency Based Grading (CBG), Computer Aided Instruction (CAI), Business Internships (Externships) and their Merit/Demerit System for behavioral management would create an individualized educational format that lends itself readily to computer support and effectively integrates computer technologies into the educational process. Each of these elements that make up the "Dreadnought(R)" System are described, as well as an administration feature. The system is named after HMS Dreadnought, a 20th Century warship of superior design. The special considerations of school organization, politics, legal support, and community support for the program are discussed, followed by the implementation plan, consisting of a survey of existing systems, development of exams and software, installation, network configuration, teacher training, and final registration and orientation process. (AEF)

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ED 442 459

Dreadnought: Educational Reform

By. William M. Strowder & Howard A. Strowder

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Dreadnought

Photo # K-4577 USS Missouri on shakedown, 1944

Powerful Education
For the
21st Century

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The Problem

On this eve of the 21st Century, the World is moving toward a global economy and a worldwide communications network (World Wide Web) while American economic growth is slowing by comparison. Other countries, such as Japan, are growing and posting numerous advances in science, technology, and economics because they've invested in earnestly upgrading their public education systems. America, on the other hand, is falling behind because its High School Education System is two hundred years old and has not kept pace with changes in industry and society.

Conceived by Horace Mann at the advent of the industrial revolution in the early 19th Century, the High School System was modeled after the assembly line production process, which reduces a complex sequence of production tasks into a series of simple, repetitive motions the average person can execute. Though state-of-the-art for its day, the assembly line is subject to the skill levels and attitudes of its workers. It also tolerates significant amounts of process waste and production failure as the "acceptable risk of doing business." "Lemons" and "slag" are the high price paid by an unlucky few to consume "mass produced goods" while a lucky few that reap its profits.

Public Education employs a similar operational process, which is usually directed toward adolescents, and, as adolescents, they have immature levels of self-discipline. Thus, the design flaws of the assembly line concept become magnified when applied to public education. Minority populations, for example, are particularly vulnerable to changes in the economy, the overall social mood, and/or political atmosphere. These factors often combine to undermine community cohesiveness, parental support, and school discipline. Thus, the percentage of educational failure in minority communities exceeds fifty percent as measured by the Ohio Proficiency Battery. Those individual failures usually develop into social dependents rather than social contributors, which form their own separate and distinct class. They become the "lemons" of our society.

As education is both a social and economic issue, it affects all our lives as it feeds and is fed by industry and society. Yet, while we as consumers refuse to accept substandard commercial merchandise and/or services at any price, we continue to accept substandard public education at ridiculous prices. Industry, on the other hand, has responded to the demand for total quality in commercial goods and services with a philosophy called Total Quality Management (TQM) which takes a holistic approach rather than a piecemeal approach to production. TQM translates a "no lemons" commitment into efficient, cost-effective, and consistent management and manufacturing procedures.

Computer network technologies have been invaluable in industry's effort to attain its TQM goals and remain competitive. Thus, increasing the survivability of TQM businesses in this dynamic global economy. However, industry is finding it increasingly difficult to secure competent employees, as computer technologies have not been uniformly or effectively integrated into the educational process. The result is a phenomena of "downsizing" to smaller staffs of well-trained, overworked people while laying-off masses of people with "high school level" skills.

Eventually, this lack of competent personnel will hamper the growth of the American Economy and adversely effect the quality of life for everyone. What's needed is an application of TQM principles to create a Total Quality Education (TQE) System.

Solution

A combination of Competency Based Grading (CBG), Computer Aided Instruction (CAI), Business Internships (Externships) and the Merit/Demerit System for behavioral management would create an individualized educational format that lends itself readily to computer support and effectively integrates computer technologies into the educational process. It would be flexible enough to accommodate a wide range of learning styles and can be administered with or without computer support. We call it the "Dreadnought®" System. Dreadnought means "fear nothing."

Competency Based Grading

Competency Based Grading (CBG) differs from traditional A-B-C-D-F grading in three ways. 1) The grade is determined by regularly scheduled, standardized comprehensive examinations in each academic discipline. 2) Each exam covers the same material (the whole course), though each may be a different version. 3) Students who tests at or above the competency level (93%) automatically become eligible for the academic enhancement program (externships).

Exams would be scheduled for five (5) times-a-year (at the beginning of the year and at the end of each quarter). Only the highest exam score would be entered as the final grade at the end of the year. However, students who obtain 93% or higher on any exam (test out) would immediately become eligible for release from the class attendance requirement and assignment to the internship (externship) or work/study program organized in cooperation with local business.

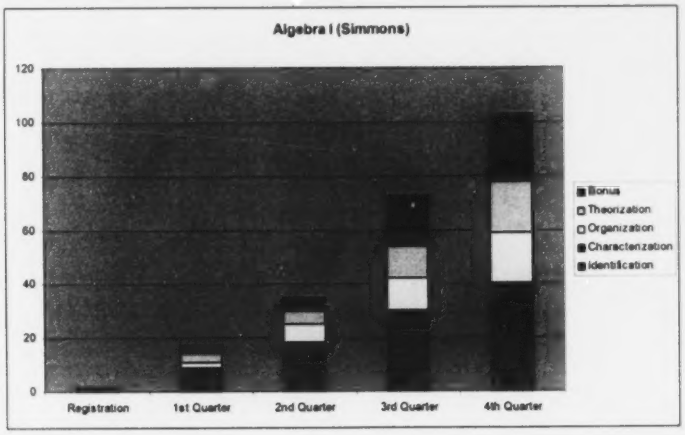
This is advantageous for students who don't test-out as well. When other students test-out and go on externships, the class size is reduced which allows the instructor to focus more attention on the remaining students. Seeing other students accelerate to the academic enhancement program may also serve as an incentive for those remaining students. At the very least, the smaller class will reduce the potential for the conflict and disorder that often comes with large, crowded classes.

The exams themselves would be constructed of four types of questions, which would indicate the student's skill at four levels:

1. **Recognition**—the ability to recognize the basic elements of a unit, concept, or idea.
2. **Characterization**—the ability to characterize or define those basic elements.
3. **Organization**—the ability to arrange the basic elements into their appropriate fixed associations and/or characterize their static relationships.
4. **Theorization**—the ability to perceive the system of behavior and/or dynamic relationships.

A graphic analysis of a student's performance at each level of mental processing would be a valuable diagnostic tool to instructors in developing the student's individualized educational program (IEP). Various reports depicting that data would be available to instructors to adjust their teaching method to suite the mix of students in that particular class.

Scores would be reported on a Series Stacked-Bar Graph such as the one pictured below.



Bonus Points (top of each stack) would be cumulative and added directly to the current or highest comprehensive exam score. They could be accrued from five sources or activities for a maximum of thirty points (30 pt.).

1. Teacher administered quizzes (5 pt. max),
2. Class assignments (5 pt. max),
3. Homework assignments (5 pt. max),
4. Computer Aided Instruction (self-paced CAI) (5 pt. max),
5. Individual projects (one per semester, 5-pt. ea. max).

Computer Aided Instruction

Computer Aided Instruction (CAI) coordinated with classroom instruction and print materials would be available twenty-four hours a day. Access could be achieved through the Internet or by direct dial-up connection granted to each individual student for each course enrolled or as deemed appropriate by the system administrator and/or principal. These modules can be written as either client-server applications or as web based (also called browser or "thin" client) applications.

The advantage of the client-server set-up is that executable tasks (programming codes) are distributed more evenly between the client PC and the network server. This helps reduce network traffic while limiting the amount of data that the PC has to parse at one time. Thus preventing the either the carrier network, the network server, or the individual PC from "locking-up." There is also greater security control on a client-server network, but significant coding skills are required to set-up the client and the server applications in coordination with each other.

The advantage of the browser-based application is that any PC can access it with a common browser such as Microsoft's Internet Explorer and dial-up or Internet connecting capabilities. This facility would allow students to access their work from home, office, library, church, etc. with a standard PC. The drawbacks are that all of the applicatien code must be executed on the web server and that performance is subject to conditions of the connection (modem, Internet, etc.).

State-of-the-art in CAI is the 3D, hyper-interactive, dynamic color simulation. Well-known

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examples include popular games such as "Duke Nukem®" and "Tomb Raider®." The Computer Based Training (CBT) library could include laboratory simulations; math and voice activated language development software on that model. These applications could also be programmed to reward the student with music videos and/or animation upon successful completion of a task.

Some of the other utilities that could be included in this network would be SAT practice software, driving simulation software, and computer programming software. The ideal set-up would include an unlimited and dynamic repertoire of programs available on demand for each course. And, in all cases, the data would be automatically captured by the primary database and parsed for addition to the students' record and/or analysis by administrators.

Business Externships

Modern education will need a dual relationship with business to ensure its practical success and social relevance. The high price of books and equipment dictates that education today receive higher levels of financial support than in our previous history. So, corporate sponsorship will be an essential part of the successful school. But students also need the intangible resource of business protocol and social interaction that occurs in the dynamic workplace to put their training into perspective. To that effect, nothing replaces the experience that externships would provide while still under the supervision and protection of the school administration.

Under the Dreadnought® system, externships prearranged with local businesses would be posted on a bulletin board, as are employment announcements. Any student testing-out of a course would give the position control number to his/her advisor and request that the advisor submit an application for the externship on the student's behalf. The procedure could be electronic so that the advisor gets the appropriate recommendations (teachers, principal, parents, etc.) and forwards the application to the employer by e-mail. Typically, a response could be received in forty-eight hours.

The application would typically include both the student's academic and conduct record to date. Students with adverse conduct records would not be dissuaded from making applications to internships when they test-out of a course, but prospective employers would be free to make their own evaluation of the student and the student's record. Subsequently, the employer could afford a transitional opportunity to a student with a previously unflattering record.

Stipends, format, and scheduling could be negotiated with individual organizations, but generally the period of the externship would coincide with the remaining class periods of the course from which the student has tested-out.

Behavioral Management--The Merit/Demerit System

Client-server database technologies now allow the capture of quantities of data that would have overloaded systems five years ago. An additional system that this client-server database would support would be the Merit/Demerit system of behavioral management.

Under the Merit/Demerit System, all offenses that a student might commit would be assigned numerical values of Demerits (negative) and all commendations would be assigned Merits (positive). This would permit the calculation of running totals that could be available to administrators on a daily basis, but lists for restriction or commendation purposes could be published every week and

every quarter.

Events in student conduct or misconduct could be reported through a Microsoft Outlook® application at any PC terminal or through portable Palm Pilots®, which would download into the primary database. The system would, then, automatically e-mail the student, his/her parents (any e-mail address), and the reporting officer to notify them of the pending change in status of the student's conduct record.

The student would, then, have forty-eight (48) hours to report to the appropriate principal and offer an acceptable explanation to avoid demerits. The principal or principals would examine pending conduct reports on a daily basis and then commit them to the database with a determination of merits, demerits, not guilty, or forgiven as appropriate. Another e-mail would, then, be generated to advise the appropriate parties of the action taken.

A very detailed, immediate and accurate conduct record such as this would be of great value to students, teachers, and parents alike. It can be used within the school to assign restriction for periods of unacceptable conduct and to award special privileges to students who post noteworthy conduct. That would be especially useful when there is a student recreation area or canteen established on the school campus.

These conduct records could be forwarded, with student consent, to potential employers with any externship applications. And they could be used in Peer Disciplinary Review Board hearings, Local District School Board hearings, or legal proceedings, if necessary.

Time Management

Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
History II	prep	prep	prep	History II
English II	History II	English II	Algebra II	English II
Algebra II				Algebra II
L	**U**	**N**	**C**	**H**
Biology	**prep**	prep	prep	**Biology**
Sociology	**Biology**	Sociology	Phys Ed.	Sociology
Phys Ed.				Phys Ed.
Extracurricular Activities Period				

The typical daily student schedules have included six (6) classes per day in 55-minute periods with lunch about mid-day. A modification of that schedule as shown above could be more flexible and more readily accommodate time for self-paced CAI as well as make externship scheduling simpler.

The longer class periods Tuesday, Wednesday, and Thursday would allow instructors to conduct long or complex activities such as labs in one session (note the Biology schedule). If no lengthy or complex activity is scheduled, the instructor could divide the class into groups and rotate those groups through as series of activities lasting about twenty minutes each (1. Class together, 2. One-on-one with teacher, 3. At individual computers, 4. Small group discussions). Or he/she could

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allow the students to stay and work on their individual projects and assignments at their workstation in their homeroom or computer "cluster."

Assignments could be distributed and progress tracked through work management software applications such as Microsoft Team Manager® or Microsoft Outlook®. Both allow close monitoring of progress on assigned tasks and provide detailed records of how and when the task was sent, received, started, and completed through e-mail.

Space Management

Two thousand computers networked together offers new options in space utilization as well as scheduling. The computerized school would, again, take its example from business and establish three general types of spaces.

1. Classroom/Lab/Lecture/Conference spaces—for delivering instruction and discussion.
2. Office Suites—these could be existing rooms subdivided by partitions into cubicles with individual telephones for each teacher. Teachers in a suite could share a networked printer and scanner. (Fax would be through the computer network.)
3. Homeroom clusters—for students. These would be traditional homerooms with small cubicles or computer carrels for the students.

This arrangement would offer more privacy for everyone and may be especially beneficial to the students as it may provide them a greater sense of individuality and, therefore, responsibility.

Administration

One of the developments in client-server database technology is OLAP (On-Line Analytical Processing) often called "Decision Support Applications." Developed to allow businesses to make quicker and more informed decisions, it's a mechanism for taking a dynaset (a sorted view) of data and changing its perspective by changing the relative position of its dimensions with just the click of a mouse. The precursor to OLAP is the Excel Pivot Table.

This feature allows administrators to analyze current data form many different perspectives in real time. A principal could look at the demerits awarded to students grouped by class and, with a click of the mouse, change the orientation of its dimensions (categories) to look at demerits awarded by teacher or even neighborhood.

OLAP would demonstrate its greatest utility in the analysis of student performance. With the examinations designed to measure student processing at each level, the database could be programmed with an OLAP application to give a read-out of student performance grouped by instructional module. This would provide a profile of the student's comprehension and learning style from which a strategy for obtaining competence could be mapped.

E-mail has become more than a simple message or communication utility. With applications like Microsoft Outlook® and Microsoft Team Manager®, email is now a task/time management tool that can be used to communicate, distribute and monitor tasks, and to manage time more efficiently. Microsoft Outlook® provides a calendar utility, which allows each user to maintain an automated schedule. When supported by MS Exchange Server, that calendar is global which allows other users

to plan meetings at the time that's most convenient for you without bothering you until you receive the automatic e-mail invitation.

When enhanced with digital ID's, e-mail is secure from unauthorized viewing, except through the application that has been loaded with the sender's decryption key. This allows faculty members to send encrypted messages to each other in confidence across the net. Individual encryption and decryption codes are called digital ID's and they can be purchased on the Web @ www.verisign.com for $9.95 ea.

Dreadnought

HMS Dreadnought was the first large-scale engineering project of the 20th Century to be constructed from a uniform blueprint, exclusively of machined parts, and employ the latest military and civil technology of her day in her operational design. She was revolutionary from both a military and industrial engineering perspective. Dreadnought rendered all other warships obsolete the day she was launched and set the standard by which all subsequent weapons systems and engineering projects would be measured, even though she was militarily superceded by submarines and aircraft.

Conceived by First Sea Lord of the Royal Navy Admiral Sir John (Jacky) Fisher, Dreadnought reasserted Great Britain's preeminence among nations as a world leader and naval power. She ensured Britain's international trading influence and protected her interests around the world. And, if imitation is the sincerest form of flattery, the one hundred seventy-seven warships around the world based on her design confirmed that sentiment.

What Dreadnought, the ship, did for industrialization and warfare in the 20th Century, we hope Dreadnought, the educational system, will do for peace and commerce in the 21st Century. With this marriage of computers and industry, we hope to set the standard by which all subsequent education will be measured. The name means "fear nothing" and we hope that our students will fear no challenge intellectual, technological, or social in the 21st Century.

Special Considerations

School Organization

Communities that employ this system must still be well organized. Any lack of focus, coordination, self-discipline, or cooperation within the administration, faculty, or staff could be fatal to a program as well designed at Dreadnought

Politics

Over the last forty years, education has become a political "football" in some communities. For Dreadnought to be effective, the political atmosphere must be supportive and generally rational.

Legal Support

On of the problems with public education over the last forty years has been the tendency for local governments to adopt unrealistic policies of "tolerance and compassion" to appease the local electorate. With an interest to remain employed, administrations have rarely contested those policies

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and have implemented them such that they have allowed increasing levels of aberrant and violent behavior by students.

The accepted interpretation of the Constitution of these United States defines persons with full rights as mentally competent persons who have reached the "age of majority." And, by virtue of those rights, they also assume some accordant responsibilities. We also assume that persons who cannot discharge those responsibilities, by reason of age (minors) or mental defect, cannot also assume all the rights. Therefore, minors do not actually have rights under the Constitution, but "protection" as an extension of their parent or guardian's rights.

Consequently, education of a minor child is the legal responsibility of the parent and common education, public or private, is provided as a service to parents. Indeed, parents are afforded several options for the education of minor children, which include public, private, or home schooling. So, it is the parent with whom the relationship and any legal response should be directed.

Without consistent and effective responses to aberrant and violent behavior by the school administration supported by local government, not even the Dreadnought system could be any more effective than the conventional approach. The Constitution provides and local ordinances should reflect that a school need not accommodate a child whose behavior substantially degrades the learning process.

It is, therefore, critical to this program that it service schools where parents contract with the school for educational services for their children under terms that specify conduct of student, parent, and employees alike. And they should provide that the parent be compelled to seek other options should either the child or the parent exceed the provisions of the contract.

Community Support

Individual self-discipline is the critical element in the educational equation, but individual self-discipline is planted and nurtured in the local community where the adults have come together to raise the children as a "village." Organizations that bring parents and children together, both for casual socializing and for reaffirmation of shared values, are invaluable to the success of any communal education effort.

Subsequently, to ensure the success of the Dreadnought program, some effort must be directed toward strengthening and supporting those organizations that support the child development process at the "grass roots" level in the communities in which Dreadnought is applied. In the past, they have been organizations such as the DeMolay, Scouting, Jack and Jill, FFA to name a few. As the interests of American Society have changed, we may have to re-invent some of these organizations.

Implementation Plan

Survey

A survey of the existing school systems, support mechanisms, and the community would be

valuable to determine the need and the plausibility for success. As academic discipline has its roots in the home, this survey should look especially for grass roots community organizations that unite parents and children under a stated set of principles in the effort to rear the children as a community.

Conducting accurate surveys for each community could prove expensive. Perhaps, this is where the Government can participate in what must essentially be a private endeavor. The Government could apply its considerable information gathering apparatus to conduct the surveys and make them available, at a reasonable fee, to the general public.

In this way, there would be no dispute about the feasibility of successfully implementing the program in a particular community and about what changes need to be made before those services can be provided. SBL's Communities Foundation would work with the community to better support the educational process.

Development

Comprehensive examinations would have to be developed that meet the requirements of the particular State. SBL has undertaken the task of writing exams for Ohio, but it will be a couple of years before they are ready for distribution. Exams could then be computer archived for future on-demand use by students and faculty through a State server for client-server, soft client (web based), or print distribution to approved accounts.

Contracts outlining the responsibilities of both student and parent should also be developed and ready for registration. The Student's Code of Conduct quantified on the Merit/Demerit should be ready and included at that time.

Software development requires some additional planning and equipment. Once underway in earnest, an effective system could be ready for installation in two years. We estimate a total of $5 Million for full implementation of the pilot project.

Installation

An engineering survey may have to be done to determine if a second electrical service is required for the facilities.

Installation of computer hardware and appropriate remodeling of internal spaces could be accomplished over a summer, given the proper planning and preparation.

Configuration

The computer network would ideally be configured with:

1. Microsoft Office 2000 Deluxe
2. Microsoft Back Office Server 2000
3. Microsoft Visual Studio 2000

Full configuration of a computer network operating 2,500 computers and ten servers could be accomplished in one month, given the proper planning and manpower.

Teacher Training

Training of teachers to effectively employ such a system could typically require initial

instruction of at least eighty (80) hours in the summer with supplemental training of throughout the year. Effective training should include the application of computer skills in environments other that the traditional classroom setting.

Implementation

Registration would begin by contracting with the parent, as legal guardian, for instructional services to their child. As registration will involve agreement to a service contract, the registration and orientation process should begin at least two months before the child is expected to report for classes.

Strowder Brothers Limited (SBL)

SBL was chartered in 1999 as a commercial enterprise initially for the distribution of fitness equipment. The first of its products are original items on which it holds U.S. and foreign patents. SBL's underlying goal, however, has always been to secure revenue to support the charitable and community development interests of its founders who have a socially progressive vision for America. Educational reform is the most important of those interests and Dreadnought is the realization of that vision.

SBL was founded as a Limited Liability Company (L.L.C.) with William M. Strowder as President and Howard A. Strowder as Vice President.

William M. Strowder holds a Bachelor's degree in Chemistry from the University of North Carolina and is studying to obtain a Master of Divinity Degree from the Methodist Theological School in Ohio. William is a computer programmer specializing in Visual Basic and SQL Database Design. The company was founded on the strength of patents on his fitness equipment.

Howard A. Strowder holds a Bachelor's degree in Business from Howard University and is an Embalmer and Funeral Director licensed in the State of Ohio. He's currently CEO of Strowder Funeral Chapels, Inc. and directing construction of an entirely new facility.

William (Bill) and Howard (Tony) make Cleveland their home where they were born and raised. They look forward to their endeavors benefiting their home community and then spreading out to the entire world.